



BUSSELTON WATER

BUSSELTON WATER
Report to the Department of Health
for the period

1 April to 30 June 2018

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Submitted to:
The Advisory Committee for the Purity of Water
Busselton Water's Website
CEO, Busselton Water (Mr Chris Elliott)



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1.0 Water Provider Information

Water Provider Contact Details			
Name of Company	Busselton Water		
Company Address	1 Fairbairn Road, Busselton WA 6280		
Company Phone	08 9781 0500	Fax	08 9754 1075
Company Email	admin@busseltonwater.wa.gov.au		
Chief Executive Officer	Chris Elliott		
DoH Liaison Officer	Peter Addison, General Manager Operations		

1.1 System Information

Busselton Water operates one large interconnected water supply system with four bore sites consisting of eight production bores, supplying three water treatment plants. Busselton Water operates its distribution system as one locality ("Busselton") and has strategically-placed sampling points throughout the distribution system.

Busselton Water's water supply is sourced from bores constructed in the Leederville and Yarragadee aquifers. The raw groundwater has turbidity and total iron concentrations above the drinking water guideline limits but these are readily removed by oxidation, aeration and filtration, and then disinfected at Busselton Water's treatment plants before distribution into the reticulation network.

Busselton Water supplies potable water to more than 26,000 customers within the Busselton townsite and close environs such as Port Geographe, Siesta Park, Vasse and Wonnerup. As a sought-after tourist destination this figure can rise significantly during weekends and holiday periods. The average daily system demand for the reporting period was 13.06ML/day.

2.0 Performance Summary

2.1 Treated Water – Microbiological Water Quality

Microbiological water quality analyses for treated water samples are collected downstream of the chlorinators at the water treatment plants. Compliance limits are summarised in the following table.

Samples were tested for thermotolerant coliforms, *E. coli* and Thermophilic *Naegleria* during the second quarter of 2018 (April to June). No microbial activity in relation to these parameters was detected during the period at any of the sample locations. Busselton Water remains fully compliant with the 2004 Australian Drinking Water Guidelines and the Memorandum of Understanding with the Department of Health in respect to *E. coli* and *N. fowleri*¹.

Period	<i>Escherichia coli</i> (<i>E. Coli</i>)				Thermophilic <i>Naegleria</i>			<i>Naegleria fowleri</i> ¹		
	No. of Samples	No. of Non-conforming Samples	Maximum Individual Value	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance
Apr-18	24	0	est <1	100%	24	0	100%	0	-	100%
May-18	16	0	est <1	100%	16	0	100%	0	-	100%
Jun-18	16	0	est <1	100%	16	0	100%	0	-	100%
Total for Second Quarter 2018	56	0	-	-	56	0	-	0	-	-
Second Quarter 2018 Compliance	100%			-	100%		-	100%		-
Required Compliance (ADWG 2004) (MOU 2011)	100%				95%			100%		

Note 1: Tests for *Naegleria Fowleri* only required if Thermophilic *Naegleria* is detected.

Note 2: Plant 1 has been offline since the end of April and has not been sampled since then.

2.2 Distributed Water - Microbiological Water Quality

Microbiological water quality analyses for the seven locations within the distribution system are sampled weekly and are summarised in the following table.

Samples were tested for thermotolerant coliforms, *E. coli* and Thermophilic *Naegleria* during the period. No microbial activity in relation to these parameters was detected during the three months at any of the sample locations. Busselton Water remains fully compliant with the 2004 Australian Drinking Water Guidelines and the Memorandum of Understanding with the Department of Health in respect to *E. coli* and *N. fowleri*¹.

Period	<i>Escherichia coli</i> (<i>E. Coli</i>)				Thermophilic <i>Naegleria</i>			<i>Naegleria fowleri</i> ¹		
	No. of Samples	No. of Non-conforming Samples	Maximum Individual Value	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance
Apr-18	35	0	est <1	100%	35	0	100%	0	-	100%
May-18	28	0	est <1	100%	28	0	100%	0	-	100%
Jun-18	28	0	est <1	100%	28	0	100%	0	-	100%
Total for Second Quarter 2018	91	0		-	91	0	-	0	-	-
Second Quarter 2018 Compliance	100%			-	100%		-	100%		-
Required Compliance (ADWG 2004) (MOU 2011)	98%				95%			100%		

Note 1: Tests for *Naegleria Fowleri* only required if Thermophilic *Naegleria* is detected.

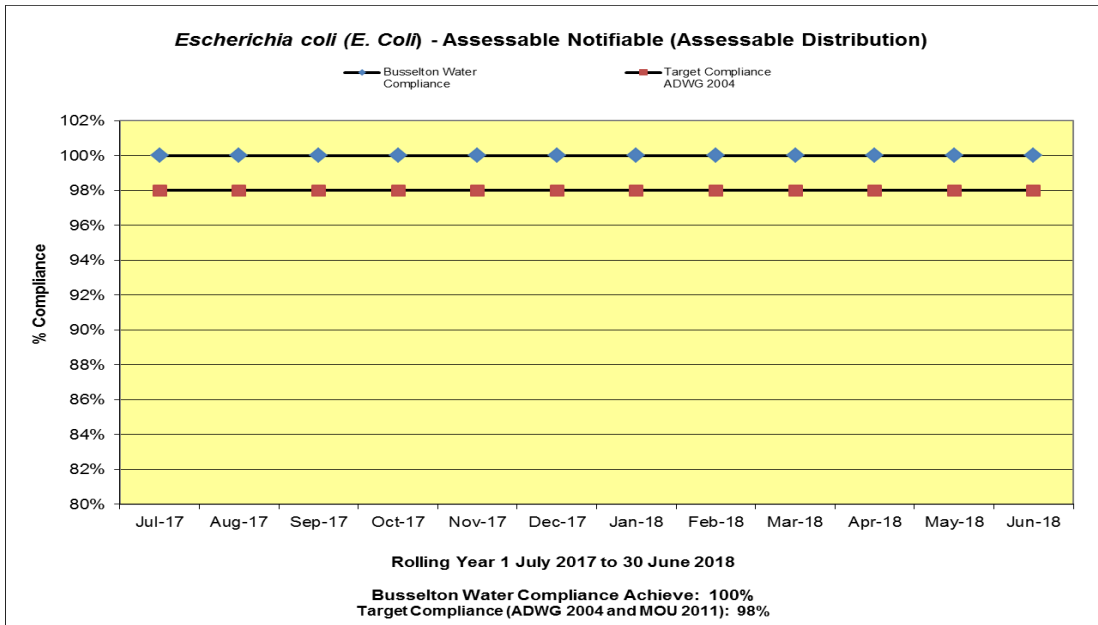
3.0 Microbial Performance (Rolling 12 Months ending 30 June 2018)

3.1 Microbiological - Exception Notifications

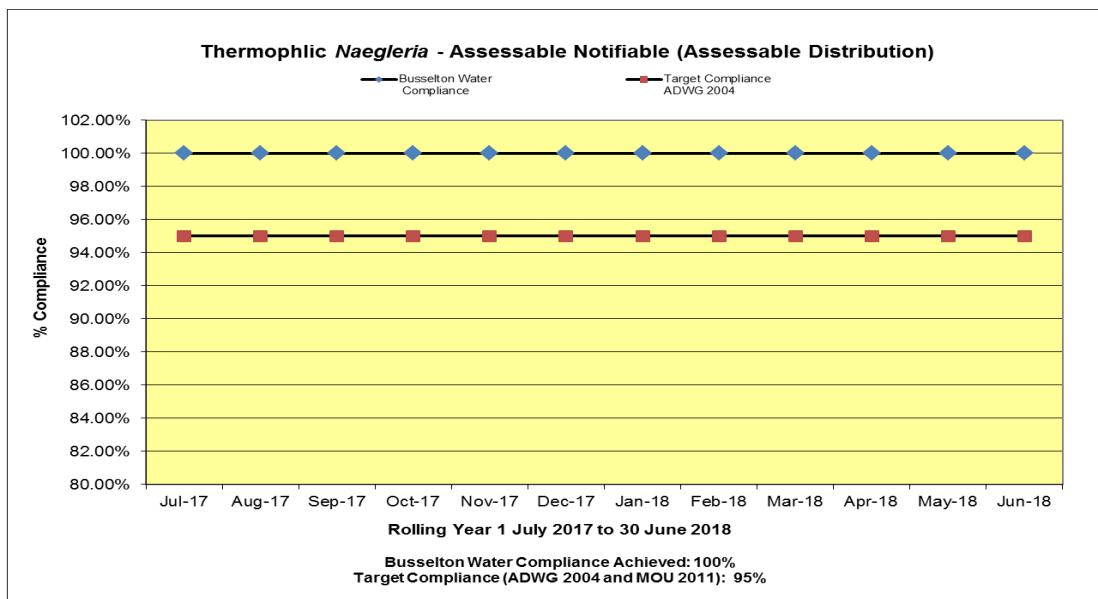
Microbiological Water Quality Exceptions							
Region/Scheme/Zone/ Service Provider	Population Served	Date	Microbiological Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
Busselton	>26,000	01/07/2017 to 30/06//2018			NIL		

3.2 Microbiological Charts - Busselton

3.2.1 *Escherichia coli* (E. Coli) – Distribution System



3.2.2 Thermophilic *Naegleria* – Distribution System



3.3 Microbiological Incident Specific Information

Microbiological Incidents				
Region/Scheme/ Zone/ Service Provider	Date of Incident	Details of Incident	MoU Alert Level	Remedial Action
Busselton	NIL			

4.0 Chemical – Health Related Performance

The results of water samples collected from the operating production bores (raw water) and at the assessable distribution sampling points (distribution water) during the period are summarised in Table 4.2 for health related guidelines. They show that the water supply is fully compliant with the 2004 health-related guidelines for drinking water, the operating licence issued by the ERA, the protocols of Busselton Water's Memorandum of Understanding with the Department of Health and the groundwater licence issued by the Department of Water.

4.1 Chemical – Health Related – Exception Notifications

Health-Related Chemical Water Quality Exceptions							
Region/Scheme/Zone/ Service Provider	Population served	Date	Health Related Chemical Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
Busselton	>26,000	01/04/2018 to 30/06/2018			NIL		

4.2 Chemical – Health Related

Type	Unit	ADWG 2004 Limit (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value	Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value mg/L	Compliance (%)
Antimony	mg/L	0.003	0.001				4	4	ND	100%
Arsenic	mg/L	0.007	0.001				4	4	ND	100%
Barium	mg/L	0.7	0.001				4	4	0.33	100%
Beryllium	mg/L	-	0.001				4	4	ND	100%
Boron	mg/L	4.0	0.005				4	4	0.23	100%

Type	Unit	ADWG 2004 Limit (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value	Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value mg/L	Compliance (%)
Bromodichloromethane	mg/L	0.25*	0.0005				3	3	ND	100%
Bromoform	mg/L	0.25*	0.0005				3	3	0.0035	100%
Cadmium	mg/L	0.002	0.0001				4	4	ND	100%
Chlorine (Total)	mg/L	5					128	128	0.71	100%
Chloroform	mg/L	0.25*	0.0005				3	3	ND	100%
Copper	mg/L	2.0	0.001				4	4	0.011	100%
Dibromochloromethane	mg/L	0.25*	0.0005				3	3	0.0014	100%
Fluoride	mg/L	1.5	0.1				21	21	0.4	100%
Lead	mg/L	0.01	0.001				4	4	ND	100%
Manganese (Soluble)	mg/L	0.5	0.005	17	17	0.16	21	21	ND	100%
Manganese (Total)	mg/L	0.5	0.005	17	17	0.099	21	21	ND	100%
Mercury	mg/L	0.001	0.00005				4	4	ND	100%
Molybdenum	mg/L	0.05	0.001				4	4	ND	100%
Nickel	mg/L	0.02	0.001				4	4	ND	100%
Nitrate	mg/L	50	0.05	5	5	0.11				
Nitrite	mg/L	3	0.005	5	5	0.025				
Selenium	mg/L	0.01	0.001				4	4	ND	100%
Silver	mg/L	0.1	0.001				4	4	ND	100%
Total Trihalomethanes	mg/L	0.25*	0.0005				3	3	0.0035	100%

Type	Unit	ADWG 2004 Limit (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value	Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value mg/L	Compliance (%)
Uranium	mg/L	0.02	0.001				4	4	ND	100%

- Note 1** Chlorine Total is a Busselton Water in-house test. All others are NATA accredited test results. The operating target for residual chlorine in the reticulation system is 0.4 – 0.6 mg/L. Total chlorine levels will be higher than residual levels.
- Note 2** * The concentration of trihalomethanes, either individually or in total, in drinking water should not exceed 0.25 mg/L
- Note 3** Busselton Water does not add fluoride to the water. The naturally occurring fluoride levels vary from bore to bore. The maximum value shown is not indicative of the level throughout the Busselton water supply. Fluoride levels in the drinking water vary with location and time and can be between 0.03 and 0.6 mg/L.

ADWG	Australian Drinking Water Guidelines
Bq/L	Becquerel per litre
CFU	colony forming units
HU	Hazen Units
mg/L	milligrams per litre
NA	Not Applicable
ND	Not Detected
NR	Not Required
NTU	Nephelometric Turbidity Units
pH	Acidity/basicity
uS/cm	Micro siemens per centimetre

5.0 Physical and Chemical – Aesthetic Performance

The results of water samples collected from the operating production bores (i.e. raw water) and at the assessable distribution sampling points (i.e. distribution water) during the period are summarised in Table 5.1 for aesthetic related guidelines. The treatment process reduces colour and iron content to below those levels specified in the Australian Drinking Water Guidelines 2004 (ADWG 2004).

5.1 Physical and Chemical - Aesthetic – Chart

Type	Unit	ADWG 2004 Limit (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value	Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value (mg/L)	Compliance (%)
Alkalinity (Bicarbonate)	mg/L	-	5	5	5	190	4	4	180	100%
Alkalinity (Carbonate)	mg/L	-	5	5	5	ND	4	4	ND	100%
100%Alkalinity (Hydroxide)	mg/L	-	5	5	5	ND	4	4	ND	100%
Alkalinity (Total)	mg/L	-	5	5	5	160	4	4	130	100%
Aluminium (Soluble)	mg/L	0.2	0.02	5	5	0.07	4	4	ND	100%
Aluminium (Total)	mg/L	0.2	0.02	5	5	ND	4	4	ND	100%
Ammonia	mg/L	0.5	0.005				4	4	ND	100%
Calcium	mg/L	-	0.2				4	4	27	100%
Chloride	mg/L	250	1	5	5	110				
Colour True	HU	15	1	17	16	37	21	21	ND	100%
Electrical Conductivity	uS/cm	-	2	17	17	730	21	21	590	100%
Filterable Reactive Phosphorus	mg/L	-	0.005	5	5	ND				
Filterable Reactive Phosphorus as PO4	mg/L	-	0.01	5	5	0.02				
Hardness (as CaCO3)	mg/L	200	5	5	5	120	4	4	120	100%
Iron (Soluble)	mg/L	0.3	0.005	17	4	8.7	21	21	0.01	100%
Iron (Total)	mg/L	0.3	0.005	17	3	8.7	21	21	0.048	100%
Magnesium	mg/L	-	0.1				4	4	14	100%
pH	pH	6.5-8.5	NR	17	17	7.9	128	128	8.4	100%
Salinity (as Total Dissolved Solids)	mg/L	500	10	17	17	370				

Type	Unit	ADWG 2004 Limit (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value	Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Individual Value (mg/L)	Compliance (%)
Silica	mg/L	-	0.05	5	5	18				
Sodium	mg/L	180	0.5	5	5	79				
Sulphate	mg/L	250	1	5	5	18				
Total Hardness by Calculation	mg/L	200	1	5	5	120	4	4	120	100%
Turbidity	NTU	5	NR	17	17	0.84	128	128	0.44	100%
Zinc	mg/L	-	0.005				4	4	0.016	100%

Note 1: pH and Turbidity are Busselton Water in-house tests. All others are NATA accredited test results.

ADWG	Australian Drinking Water Guidelines
Bq/L	Becquerel per litre
CFU	colony forming units
HU	Hazen Units
mg/L	milligrams per litre
NA	Not Applicable
ND	Not Detected
NR	Not Required
NTU	Nephelometric Turbidity Units
pH	Acidity/basicity
uS/cm	Micro siemens per centimetre

6.0 Radiological Performance

6.1 Radiological – Exception Notifications

Radiological Water Quality Exceptions							
Region/Scheme/Zone/ Service Provider	Population served	Date	Radiological Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
Busselton	>26,000	01/04/2018 to 30/06/2018			NIL		

6.2 Radiological Performance

Type	ADWG 2004 Limit (Bq/L)	Raw Water (Bores)			Treated Water (Storage Tanks)		
		Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Detected Bq/L	Number Assessed	Number Complying with ADWG 2004 Limit	Maximum Detected Bq/L
Gross Alpha	0.5	7	7	0.171	5	5	0.186
Gross Beta	0.5	7	7	0.147	5	5	0.130

Note: 1: Radiological Performance is tested annually in April.

7.0 Planned Sample Summary (Quarter Ending 30 June 2018)

Region/ Scheme/ Zone	Microbiological			Physical and Chemical			Radiological			Fluoride		
	Planned	Taken	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
Busselton	156	147	94.23%	733	733	100%	12	12	100%	21	21	100%

Note 1 Chemical testing totals shown in Table 7.0 relate to scheduled NATA and in-house sampling undertaken in accordance with Busselton Water's Water Quality Monitoring Program, which has been endorsed by the Department of Health.

7.1 Planned Sample Exceptions

Planned Sample Exceptions			
Region/ Scheme/ Zone	Characteristic (Microbiological/ Physical and Chemical/ Radiological)	Number of Samples	Reason for missed sample
Busselton	Microbiological	9	Nine weekly Treated Water samples were not taken from Plant 1 this quarter as the Plant was offline from the end of April 2018.

8.0 General Notes / Other News

Nil